UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,980	01/03/2005	Peder Oscar Andersen	60275-USA	2890

48219 7590 06/23/2010

PATENT ADMINISTRATOR
FMC CORPORATION
1735 MARKET STREET
PHILADELPHIA, PA 19103

EXAMINER	
SHEIKH, HUMERA N	
ART UNIT	PAPER NUMBER
1615	
MAIL DATE	DELIVERY MODE
06/23/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/509,980	ANDERSEN ET AL.	
	Examiner	Art Unit	
	Humera N. Sheikh	1615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 March 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *50-55,70,73,82,84-88,91-94,96-103,110-114 and 119* is/are pending in the application.

4a) Of the above claim(s) *85,86,93,94,103,113,114 and 119* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *50-55,70,73,82,84,87,88,91,92,96-102 and 110-112* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/19/10; 4/19/10*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Application

Receipt of the Response to Non-Final Office Action, the Amendment and Applicant's Arguments/Remarks, all filed 11/19/09 and 03/25/10 is acknowledged. Receipt is also acknowledged of the Information Disclosure Statements (IDS) filed 01/19/10 and 04/19/10.

Applicant has overcome the following rejections by virtue of the amendment to the claims and/or persuasive remarks: (1) The 35 U.S.C. §102(b) rejection over Shigeno *et al.* (U.S. Pat. No. 5,385,737) has been withdrawn; (2) The 35 U.S.C. §103(a) rejection over Lee *et al.* (EP 0480729 A1) in view of Gåserød *et al.* (WO 99/02252) has been withdrawn.

Claims 50-55, 70, 73, 82, 84-88, 91-94, 96-103, 110-114 and 119 are pending in this action. Claims 50-55, 70, 73, 82, 84, 87, 88, 91-92, 96-102 and 110-112 have been examined in this action. Claims 85, 86, 93, 94, 103, 113, 114 and 119 remain withdrawn (based on non-elected invention). Claims 50-55, 70, 73, 82, 84, 87, 88, 91, 92, 96-102 and 110-112 remain rejected.

* * * * *

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 01/19/10 and 04/19/10 were filed after the mailing date of the Non-Final Office Action on 06/19/09. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

* * * * *

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 50-55, 70, 73, 82, 84, 87, 88, 91, 92, 96-99 and 110-112 are rejected under 103(a) as being unpatentable over Shigeno *et al.* (hereinafter "Shigeno") (U.S. Pat. No. 5,385,737) in view of Lee *et al.* (hereinafter "Lee") (EP 0480729 A1).

Shigeno ('737) teaches surfactant-containing seamless capsules comprising an inner layer and an outer layer having a film-forming material, wherein said inner layer comprises a liquid containing an oily component and a surfactant component. The capsules have excellent emulsive and surfactant dispersibility and solubility in the oily component and can be used in the pharmaceutical field and other fields (see Abstract); (col. 1, line 5 – col. 3, line 27). The outer layer of the capsule is formed of a film-forming material. Any film-forming material can be used as long as it hardens or gels upon a physical treatment, such as cooling or chemical treatment (col. 5, lines 14-25). This process step of cooling to form a hardened or gelled film-forming material reads on the "drying" step claimed by Applicant. Suitable film-forming materials disclosed include sodium alginate and alginic acid propylene glycol, used singly or in combination. The inner layer comprises a single layer, or two or more concentric layers, which are formed with an appropriate combination of layers (col. 3, line 64 – col. 5, line 40). Surfactants are incorporated in the inner layer. Suitable surfactants are disclosed at column 6, line 15 – column 7, line 17. The emulsion formed based on the surfactant, oil and water components can be an oil-in-water emulsion (col. 7, line 52 - col. 8, line 7. Oily components are also incorporated in the inner layer in amounts of from 2 to 150% (col. 7, line 18 – col. 8, line 17). This range meets and falls within the amount of oil instantly claimed ("at least 50% by weight) in claim 50. The methods of producing the seamless capsules involve using multiple nozzle of triple or more having a sequentially increasing diameter (col. 2, line 51 – col. 3, line 24). Shigeno teaches that the film-forming liquid of the multi-layered droplets is hardened or gelled by physical or chemical means. In the case where the film-forming liquid is gelled chemically, an aqueous solution containing calcium chloride or calcium phosphate for sodium

alginate are appropriately selected and cross-linking and other reactions of the film-forming liquid with these hardeners result in gelation (col. 9, line 41- col. 10, line 21). Thus, Shigeno teaches the use of salts, such as calcium, for gelation of the film-forming material (alginate). Shigeno teaches that the film ratio, i.e., the ratio of film weight to capsule weight is 5 to 60% (col. 12, lines 36-41). This ratio meets the capsule weight of instant claims 53-54. The average particle diameter of the capsules is from 0.2 mm to 2 cm and preferably 3 mm to 2 cm. The thickness of the capsules is 0.01 mm to 5mm (col. 12, lines 42-54). Thus, the particle diameter and capsule thickness disclosed by Shigeno reads on the diameter and thickness dimensions as claimed in instant claims 52 and 55.

Shigeno does not teach that their capsule is "enteric or delayed release".

Lee ('729) teaches a microencapsulation method for the preparation of a controlled release oral drug delivery system and capsules formed thereby. The method comprises microencapsulation of an oil droplet containing drugs for oral administration using a polysaccharide which has metal-chelating capacity and a biocompatible and water soluble polymer as a capsule material (see Abstract; p. 2, line 5-13). The method entails mixing the drug with liquid oil, whereby the drug-dispersed oil phase to be incorporated in the microcapsule is added to the aqueous solution mixture (to be used as the capsule material) of polysaccharide, biocompatible and water soluble polymer. The two phase system is (oil/aqueous mixture) is subjected to sonication to produce an oil-in-water emulsion containing the drug-dispersed oil droplets in the range of 1-5 micron range of diameter (p. 2, lines 25-31). The polysaccharide which has metal-chelating capacity includes sodium alginate and pectin (p. 2, lines 36-37).

Sodium salt of alginic acid is used as the microcapsule material. Sodium alginate is water soluble and has good biodegradability and is widely used in cosmetics, food, pharmaceuticals, medicine and the like (p. 2, lines 42-44). The core material is a liquid oil, which is widely used for pharmaceuticals (p. 2, lines 53-55). Drugs are added in amounts of 1-40% (p.3, line 56 - p. 4, line 2). Emulsifying agents are used in the process in order to prepare for the stable oil-in-water emulsion (p. 4, lines 3-8). Multivalent cations used include calcium ions, aluminum ions or magnesium ions, provided in amounts of 0.5-5 wt % (p. 4, lines 11-13). The capsules are enteric or delayed release capsules that can comprise an enteric coating such as hydroxypropylmethylcellulose phthalate (p. 5, Example 9). This meets the limitations of instant claim 50, section (v).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the delayed or controlled release polymers of Lee within the capsules of Shigeno in order to yield an enteric or delayed release capsule. One would do so with a reasonable expectation of success because Lee teaches a microencapsulation method for the preparation of a controlled release oral drug delivery system and capsules, which utilize an enteric coating such as hydroxypropylmethylcellulose phthalate to obtain an enteric or delayed release capsule. The secondary reference of Lee demonstrates that the use of enteric/delayed release polymers is well-known in the capsule art. The expected result would be an improved controlled release capsule for delivery of active agents.

With regards to the percentages and ratios claimed by Applicant, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine suitable amounts/ranges via routine or manipulative experimentation, to obtain optimal results,

as these are variable parameters attainable within the art. See *In re Aller* 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). Likewise, the specific capsule dimensions (i.e., diameter, thickness) would be determined by routine optimization to acquire the best results.

With regards to the particular shape of the capsule being claimed (oblong, oval, cylindrical), it is the position of the Examiner that the particular shape of the capsule does not impart patentability to the instant invention, since the particular shape of the capsule would be based on personal preference in order to provide for an aesthetic appearance or for ease of consumability for the user. The prior art teaches a capsule as claimed comprising the same elements, ingredients and features as claimed. The particular shape of the capsule would be determined by one of ordinary skill in the art based on suitability for its intended use or appearance, as discussed above.

* * * * *

Claims 50-55, 70, 73, 82, 84, 87, 88, 91, 92, 96-102 and 110-112 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamura *et al.* (hereinafter "Okamura") (U.S. Pat. No. 5,942,266) in view of Gåserød *et al.* (hereinafter "Gåserød") (WO 99/02252) and further in view of Lee *et al.* (hereinafter "Lee") (EP 0480729 A1).

Okamura ('266) teaches a capsule comprising in an alginate shell a composition comprising marmelo mucilago, water, an oleaginous substance such as a vegetable oil, a water-soluble polyvalent metal salt and sodium chloride. The capsule is made by contacting liquid drops of the composition with an aqueous

solution of an alginate (see Abstract, column 1, lines 61-67 and claims 1 & 3). The resulting capsules are subjected to aqueous rinse, pH adjustment and stored in wetted condition (see column 6, lines 48-56).

Preferred water-soluble polyvalent metal salts disclosed include water-soluble salts of calcium, such as calcium chloride, calcium lactate and calcium acetate (col. 3, lines 1-15). The composition may include vitamins, antiseptics and the like and thus includes pharmaceuticals (col. 3, line 62 - col. 4, line 4). Okamura teaches that the size of the capsules is generally about 0.5-15 mm (col. 4, lines 29-31). While the instant thickness levels of the membrane are not explicitly taught, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine suitable thickness of the membrane based on routine or manipulative experimentation, to obtain the best possible results, as these are variable parameters attainable within the art.

The edible capsules can be used as pharmaceutical capsules (col. 4, lines 41-47). The amount of oleaginous substance (i.e., vegetable oil) can be from 10-95 wt% (col. 3, lines 27-44). This range meets and falls within the amount of oil instantly claimed ("at least 50% by weight oil) in claim 50. Emulsifiers such as soybean lecithin are added to the composition (Example 3 at col. 6).

With regards to the instant limitation of a "seamless capsule", it is noted that the capsules of Okamura are also seamless capsules. The capsules are formed by a dipping method which comprises contacting liquid drops of the composition with an aqueous solution of an alginate, which would yield a "seamless capsule" as claimed.

It is noted that Okamura includes marmelo mucilage in the capsule composition, whereas the instant invention does not contain marmelo mucilage. However, the instant "comprising" claim language permits the inclusion of additional ingredients asides from those instantly recited, including the marmelo mucilage of Okamura. The transitional term "comprising", which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., > Mars Inc. v. H.J. Heinz Co., 377 F.3d 1369, 1376, 71 USPQ2d 1837, 1843 (Fed. Cir. 2004) ("like the term comprising,' the terms containing' and mixture' are open-ended."). The "comprising" claim language does not exclude the marmelo mucilage of Okamura.

With regards to the particular shape of the capsule being claimed (oblong, oval, cylindrical), it is the position of the Examiner that the particular shape of the capsule does not impart patentability to the instant invention, since the particular shape of the capsule would be based on personal preference in order to provide for an aesthetic appearance or for ease of consumability for the user. The prior art teaches a capsule as claimed comprising the same elements, ingredients and features as claimed. The particular shape of the capsule would be determined by one of ordinary skill in the art based on suitability for its intended use or appearance, as discussed above.

Okamura does not teach the "G" content of the ionic gel membrane to be at least 30% (claim 100), from 40% to 80% (claim 101) and from 50% to 90% (claim 102).

Gåserød (WO '252) teaches capsules having a polyanionic polysaccharide (i.e., alginate, pectin) core and a polycationic polysaccharide (i.e., chitosan) membrane layer formed by adding

a polyvalent ion, such as calcium, in the polyanion-polycation membrane forming step (see Abstract, p. 7, lines 5-9). Any polyanionic polysaccharide that can be cross-linked and/or gellable by means of a polyvalent cation may be used. The polyvalent cation can be calcium, strontium, barium, aluminum or iron (p. 10, lines 25-27). Gåserød teaches that when the alginate bead core has a higher G-block content, improved chitosan binding can be achieved, resulting in higher strength capsules. Accordingly, preferred alginates have a G-block content of at least 50%, more preferably, 60 to 75% (p. 10, lines 7-16); (p. 11, lines 1-19). These percentages of G-block content read on the content percentages claimed in claims 100-102.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the alginates having a high G-block content (at least 50%, more preferably, 60 to 75%) as taught by Gåserød within the capsule formulations of Okamura. One would do so with a reasonable expectation of success because Gåserød teaches that higher G-block content leads to improved polysaccharide binding and thus results in capsules having increased strength. The expected result would be an improved durable capsule for delivery of agents.

While the instant molecular weight of alginate, as in claims 96 & 97, is not taught, Gåserød does teach that the molecular weight of a polysaccharide has an effect on both the release characteristics of an active ingredient as well as the strength of the capsules. A higher molecular weight polysaccharide results in a reduced pore size, enabling a lower rate of release of the active ingredient, whereas in contrast, a lower molecular weight polysaccharide results in increased pore size, enabling a faster rate of release of the active ingredient. Molecular weight also influences capsule strength and results in either a thin or thick membrane layer (p. 13, lines 18-29). Thus, it would be obvious to one of ordinary skill in the art to employ alginates based on

particular molecular weights in order to manipulate the release rate of an active ingredient and obtain capsules of suitable strength. With regards to the ratios of mixtures of alginates of claim 98, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine suitable ratios when using multiple alginates based on routine or manipulative experimentation, to obtain optimal results, as these are variable parameters attainable within the art. Given the teachings of Okamura and Gåserød, the instant invention, when taken as a whole, would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Okamura does not teach that their capsule is "enteric or delayed release".

Lee ('729) teaches a microencapsulation method for the preparation of a controlled release oral drug delivery system and capsules formed thereby. The method comprises microencapsulation of an oil droplet containing drugs for oral administration using a polysaccharide which has metal-chelating capacity and a biocompatible and water soluble polymer as a capsule material (see Abstract; p. 2, line 5-13). The method entails mixing the drug with liquid oil, whereby the drug-dispersed oil phase to be incorporated in the microcapsule is added to the aqueous solution mixture (to be used as the capsule material) of polysaccharide, biocompatible and water soluble polymer. The two phase system is (oil/aqueous mixture) is subjected to sonication to produce an oil-in-water emulsion containing the drug-dispersed oil droplets in the range of 1-5 micron range of diameter (p. 2, lines 25-31). The polysaccharide which has metal-chelating capacity includes sodium alginate and pectin (p. 2, lines 36-37). Sodium salt of alginic acid is used as the microcapsule material. Sodium alginate is water

soluble and has good biodegradability and is widely used in cosmetics, food, pharmaceuticals, medicine and the like (p. 2, lines 42-44). The core material is a liquid oil, which is widely used for pharmaceuticals (p. 2, lines 53-55). Drugs are added in amounts of 1-40% (p.3, line 56 - p. 4, line 2). Emulsifying agents are used in the process in order to prepare for the stable oil-in-water emulsion (p. 4, lines 3-8). Multivalent cations used include calcium ions, aluminum ions or magnesium ions, provided in amounts of 0.5-5 wt % (p. 4, lines 11-13). The capsules are enteric or delayed release capsules that can comprise an enteric coating such as hydroxypropylmethylcellulose phthalate (p. 5, Example 9). This meets the limitations of instant claim 50, section (v).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the delayed or controlled release polymers of Lee within the capsules of Okamura in order to yield an enteric or delayed release capsule. One would do so with a reasonable expectation of success because Lee teaches a microencapsulation method for the preparation of a controlled release oral drug delivery system and capsules, which utilize an enteric coating such as hydroxypropylmethylcellulose phthalate to obtain an enteric or delayed release capsule. The secondary reference of Lee demonstrates that the use of enteric/delayed release polymers is well-known in the capsule art. The expected result would be an improved controlled release capsule for delivery of active agents.

* * * * *

Claims 50-55, 70, 73, 82, 84, 87, 88, 91, 92, 96-102 and 110-112 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda *et al.* (hereinafter "Ueda") (U.S. Pat. No.

4,702,921) in view of Gåserød *et al.* (hereinafter "Gåserød") (WO 99/02252) and further in view of Lee *et al.* (hereinafter "Lee") (EP 0480729 A1).

Ueda ('921) teaches fish-egg-like edible products consisting of capsules and methods for preparing thereof, whereby the capsules are formed of calcium alginate membranes filled with an oil material and a viscous fluid separately contained therein, surrounded by a viscous emulsion consisting of the viscous fluid and oil material (see Abstract, column 1, lines 43-58). The capsules are formed by a) preparing an emulsion comprising a viscous fluid consisting of an aqueous sol material and water, a calcium salt and an oil material; (b) dropping the emulsion into an alginate solution and thereby surrounding the dropped emulsion with membranes of calcium alginate and c) separating the encapsulated emulsion into the aqueous phase consisting of the viscous fluid and the oil phase consisting of the oil material by heating the capsules (col. 1, lines 59-68).

Surfactants and emulsifiers (i.e., lecithin) are included in the procedure for forming the capsule (col. 2, lines 39-44). The edible capsules comprise oils (i.e., vegetable oil) (col. 3, lines 26-32. While the amount of oils is not disclosed (to be at least 50% by weight, from 70-98% % from 85-95%) as in claims 50, 91 & 92, respectively, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine suitable amounts/ranges of oils based on routine or manipulative experimentation, to obtain the best possible results, as these are variable parameters attainable within the art. See *In re Aller* 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Ueda teaches that the capsules are swelled with water to a diameter of about 8 mm (col. 8, lines 5-8). This size reads on the wet capsule diameter claimed in claim 52 (1 mm to 40 mm).

While the instant thickness level of the membrane are not explicitly taught, the determination of suitable or effective thickness of the alginate membrane is a routine or manipulative experimentation, to obtain the best possible results, as these are variable parameters attainable within the art.

With regards to the instant limitation of a "seamless capsule", it is noted that the capsules of Ueda are also seamless capsules. The capsules are formed by a dipping method, which involves dropping the emulsion into an alginate solution and thereby surrounding the dropped emulsion with membranes of calcium alginate, which would yield a "seamless capsule" as claimed.

With regards to the particular shape of the capsule being claimed (oblong, oval, cylindrical), it is the position of the Examiner that the particular shape of the capsule does not impart patentability to the instant invention, since the particular shape of the capsule would be based on personal preference in order to provide for an aesthetic appearance or for ease of consumability for the user. The prior art teaches a capsule as claimed comprising the same elements, ingredients and features as claimed. The particular shape of the capsule would be determined by one of ordinary skill in the art based on suitability for its intended use or appearance, as discussed above.

Ueda does not teach the "G" content of the ionic gel membrane to be at least 30% (claim 100), from 40% to 80% (claim 101) and from 50% to 90% (claim 102).

Gåserød (WO '252) teaches capsules having a polyanionic polysaccharide (i.e., alginate, pectin) core and a polycationic polysaccharide (i.e., chitosan) membrane layer formed by adding

a polyvalent ion, such as calcium, in the polyanion-polycation membrane forming step (see Abstract, p. 7, lines 5-9). Any polyanionic polysaccharide that can be cross-linked and/or gellable by means of a polyvalent cation may be used. The polyvalent cation can be calcium, strontium, barium, aluminum or iron (p. 10, lines 25-27). Gåserød teaches that when the alginate bead core has a higher G-block content, improved chitosan binding can be achieved, resulting in higher strength capsules. Accordingly, preferred alginates have a G-block content of at least 50%, more preferably, 60 to 75% (p. 10, lines 7-16); (p. 11, lines 1-19). These percentages of G-block content read on the content percentages claimed in claims 100-102.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the alginates having a high G-block content (at least 50%, more preferably, 60 to 75%) as taught by Gåserød within the capsule formulations of Ueda. One would do so with a reasonable expectation of success because Gåserød teaches that higher G-block content leads to improved polysaccharide binding and thus results in capsules having increased strength. The expected result would be an improved durable capsule for delivery of agents.

While the instant molecular weight of alginate, as in claims 96 & 97, is not taught, Gåserød does teach that the molecular weight of a polysaccharide has an effect on both the release characteristics of an active ingredient as well as the strength of the capsules. A higher molecular weight polysaccharide results in a reduced pore size, enabling a lower rate of release of the active ingredient, whereas in contrast, a lower molecular weight polysaccharide results in increased pore size, enabling a faster rate of release of the active ingredient. Molecular weight also influences capsule strength and results in either a thin or thick membrane layer (p. 13, lines 18-29). Thus, it would be obvious to one of ordinary skill in the art to employ alginates based on

particular molecular weights in order to manipulate the release rate of an active ingredient and obtain capsules of suitable strength. With regards to the ratios of mixtures of alginates of claim 98, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine suitable ratios when using multiple alginates based on routine or manipulative experimentation, to obtain optimal results, as these are variable parameters attainable within the art. Given the teachings of Ueda and Gåserød, the instant invention, when taken as a whole, would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Ueda does not teach that their capsule is "enteric or delayed release".

Lee ('729) teaches a microencapsulation method for the preparation of a controlled release oral drug delivery system and capsules formed thereby. The method comprises microencapsulation of an oil droplet containing drugs for oral administration using a polysaccharide which has metal-chelating capacity and a biocompatible and water soluble polymer as a capsule material (see Abstract; p. 2, line 5-13). The method entails mixing the drug with liquid oil, whereby the drug-dispersed oil phase to be incorporated in the microcapsule is added to the aqueous solution mixture (to be used as the capsule material) of polysaccharide, biocompatible and water soluble polymer. The two phase system is (oil/aqueous mixture) is subjected to sonication to produce an oil-in-water emulsion containing the drug-dispersed oil droplets in the range of 1-5 micron range of diameter (p. 2, lines 25-31). The polysaccharide which has metal-chelating capacity includes sodium alginate and pectin (p. 2, lines 36-37). Sodium salt of alginic acid is used as the microcapsule material. Sodium alginate is water

soluble and has good biodegradability and is widely used in cosmetics, food, pharmaceuticals, medicine and the like (p. 2, lines 42-44). The core material is a liquid oil, which is widely used for pharmaceuticals (p. 2, lines 53-55). Drugs are added in amounts of 1-40% (p.3, line 56 - p. 4, line 2). Emulsifying agents are used in the process in order to prepare for the stable oil-in-water emulsion (p. 4, lines 3-8). Multivalent cations used include calcium ions, aluminum ions or magnesium ions, provided in amounts of 0.5-5 wt % (p. 4, lines 11-13). The capsules are enteric or delayed release capsules that can comprise an enteric coating such as hydroxypropylmethylcellulose phthalate (p. 5, Example 9). This meets the limitations of instant claim 50, section (v).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the delayed or controlled release polymers of Lee within the capsules of Ueda in order to yield an enteric or delayed release capsule. One would do so with a reasonable expectation of success because Lee teaches a microencapsulation method for the preparation of a controlled release oral drug delivery system and capsules, which utilize an enteric coating such as hydroxypropylmethylcellulose phthalate to obtain an enteric or delayed release capsule. The secondary reference of Lee demonstrates that the use of enteric/delayed release polymers is well-known in the capsule art. The expected result would be an improved controlled release capsule for delivery of active agents.

* * * * *

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or

improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 50-55, 70, 82, 84, 87, 88, 91-92 and 110-112 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 53-60 of copending Application No. 11/713,176 ('176 application). Although the conflicting claims are not identical, they are not patentably distinct from each other because the copending '176 application also claims a seamless capsule comprising oil, surrounded by a gelled gel-forming polymer having capsule dimensions as instantly claimed in the '980 application. The gel-forming polymer can be an alginate (see claim 58 in '176) as is claimed in instant claim 50. The capsule can comprise materials such as pharmaceuticals, neutraceuticals, confectionaries, food and the like (see claim 59) as is claimed in instant claim 87. The capsule in the '176 application is non-spherical, thus indicating that it can be in the shape of an oblong, oval or cylindrical capsule, as is claimed in instant claim 50.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

* * * * *

Response to Arguments

Applicant's arguments filed 11/19/09 have been fully considered and were found to be partially persuasive.

- **Rejection under 35 U.S.C. §102(b) over Shigeno *et al.* (U.S. Pat. No. 5,385,737); Rejection under 35 U.S.C. 103(a) over Okamura *et al.* (U.S. Pat. No. 5,942,266) in view of Gåserød *et al.* (WO 99/02252) and Rejection under 35 U.S.C. 103(a) over Ueda *et al.* (U.S. Pat. No. 4,702,921) in view of Gåserød *et al.* (WO 99/02252):**

Applicant argued, "The Examiner did not include claim 71 in any of the foregoing rejections. In view of the incorporation of claim 71 into claim 50, withdrawal of the foregoing rejections is respectfully requested."

Applicant's arguments have been considered and were found to be persuasive based on the amendment to claim 50, which incorporates the limitations of claim 71, drawn to an 'enteric or delayed release capsule'. Accordingly, the 35 U.S.C. §102(b) rejection over Shigeno *et al.* (U.S. Pat. No. 5,385,737) has been withdrawn.

However, the 35 U.S.C. §102(b) rejection over Shigeno has now been applied under 35 U.S.C §103(a). The reference of Lee ('729) has been applied as a secondary reference to demonstrate that the use of enteric or controlled release polymers is well-known known in the capsule art in order to provide for controlled release of active agents.

Similarly, the Lee reference has been applied as a tertiary reference for the 35 U.S.C §103(a) rejections over Okamura in view of Gåserød and Ueda in view of Gåserød, to demonstrate that the use of enteric or controlled release polymers is well-known known in the capsule art in order to provide for controlled release of active agents.

- **Rejection under 35 U.S.C. 103(a) over Lee *et al.* (EP 0480729) in view of Gåserød *et al.* (WO 99/02252):**

Applicant argued, "The combination of Lee and Gaserod does not disclose the presently claimed seamless capsules possessing a large amount of oil that are oblong, oval or cylindrical. Lee is directed to a distinctly different freeze-dried matrix that exists in the powdered state as a final product. As Lee forms a powdered matrix by freeze-drying an emulsion, it is not seen how one skilled in the field would be able to modify the teachings in Lee (relating to a powdered matrix) and arrive at the seamless capsules of the present invention."

Applicant's arguments have been considered and were found to be persuasive. Accordingly, the 35 U.S.C. §103(a) rejection over Lee *et al.* (EP 0480729 A1) in view of Gåserød *et al.* (WO 99/02252) has been withdrawn.

However, as noted above, the Lee reference has now been applied as a secondary and/or tertiary reference for the teaching that the use of enteric or controlled release polymers is well-known known in the capsule art in order to provide for controlled release of active agents. The argument that 'Lee is directed to a distinctly different freeze-dried matrix that exists in the powdered state as a final product' is not persuasive to the extent that Lee is now a secondary/tertiary reference. Note in particular that Lee is also directed to the same dosage

forms – capsules. In addition, the primary references all initially recognize and teach "seamless" capsules and thus, meet this limitation requirement of the present claims. Furthermore, the instant claims do not exclude the added step of freeze-drying an emulsion, as disclosed by Lee. With respect to the amount of oil and the particular shape of the capsule (oval, oblong, cylindrical), it remains the position of the Examiner that these are parameters that can be obtained via routine experimentation based on the desired or intended result. No patentability is seen in the particular shape of the capsule, which can be varied based on preference. The references in combination are sufficient to meet the claims as presently recited.

This rejection is maintained.

- **Double Patenting Rejection:**

Applicant argued, "The Examiner provisionally rejected claims 50-55, 70, 82, 84, 87, 88, 90-92 and 110-112 on the grounds of nonstatutory obviousness-type double patenting over claims 53-60 of copending Application No. 11/713,176. Applicants will consider the desirability of filing a terminal disclaimer at such time as an indication of allowable subject matter is received."

This argument has been considered. The double patenting rejection over copending Application No. 11/713,176 has been maintained herein, as neither has a terminal disclaimer been yet filed nor have the claims been amended to such an extent so as to overcome the double patenting rejection. This rejection is maintained.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

--No claims are allowed at this time.

This application contains claims 85, 86, 93, 94, 103, 114 and 119 drawn to an invention nonelected with traverse in the reply filed on 27 March 2009 and 25 September 2008. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Humera N. Sheikh whose telephone number is (571) 272-0604. The examiner can normally be reached on Monday-Friday during regular business hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert A. Wax, can be reached on (571) 272-0623. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Humera N. Sheikh/

Primary Examiner, Art Unit 1615

hns

June 21, 2010